



# parking management workshop

River Market, Kansas City, 9/21/16

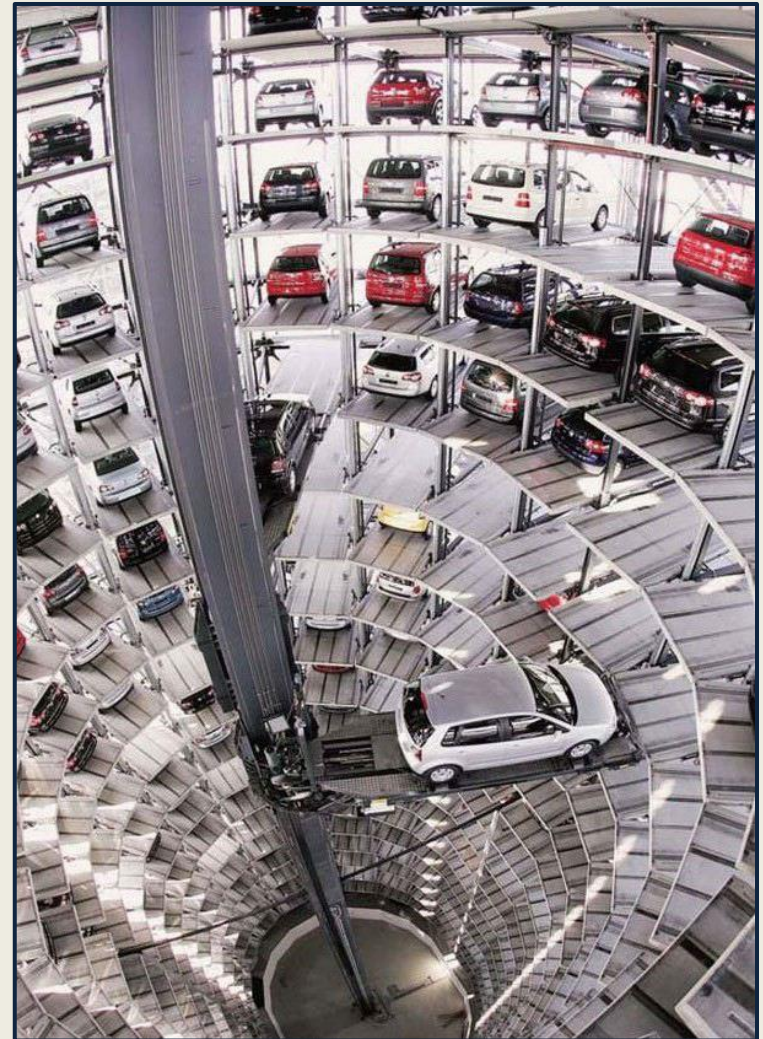


# last night

trends

challenges

parking management





# today

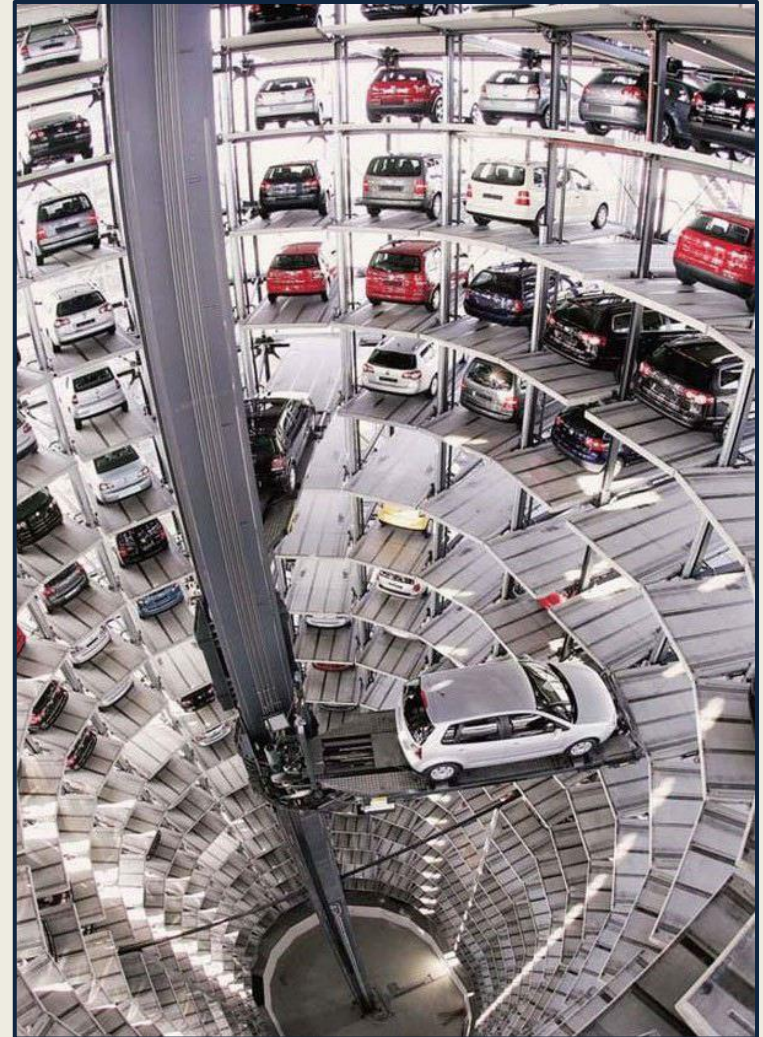
review

parking basics

parking strategies

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break out groups





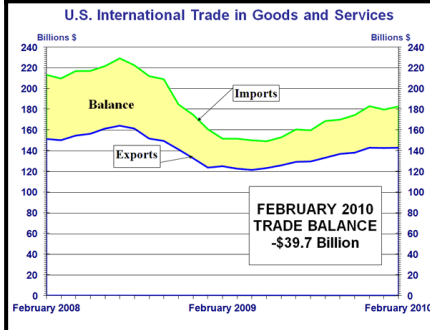
review





# *culture*

## economics



## energy prices



## technology



## vehicular travel

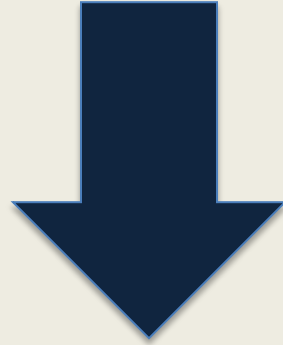




vmt



per capita  
vmt



auto  
ownership



parking  
demand

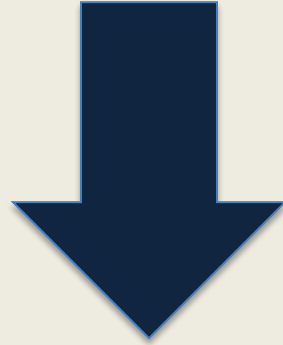
# summary – national trends



vmt



per capita  
vmt



auto  
ownership



parking  
demand

# river market trends



# parking basics





# basics

- ✓ parking types/roles
- ✓ utilization data
- ✓ how full is “full”
- ✓ measuring turnover



# parking types - classification

	public/private		
	public	private	private
on-street	<div>paid</div> <div>free</div>	<div>paid</div> <div>free</div>	<div>paid</div> <div>free</div>
surface lots	<div>paid</div> <div>free</div>	<div>paid</div> <div>free</div>	<div>paid</div> <div>free</div>
garages	<div>paid</div> <div>free</div>	<div>paid</div> <div>free</div>	<div>paid</div> <div>free</div>



## on-street

- ✓ storefront parking
- ✓ customer access
- ✓ short duration
- ✓ high turnover
- ✓ highly valuable



# surface lots

- ✓ employee parking
- ✓ customer parking
- ✓ destination parking (market)
- ✓ longer duration
- ✓ lower turnover
- ✓ (land banking)





# parking garages

- ✓ employee parking
- ✓ customer parking
- ✓ residential parking
- ✓ destination parking
- ✓ weather-protected
- ✓ longer duration
- ✓ lower turnover
- ✓ expensive

*may have to be  
paid parking*



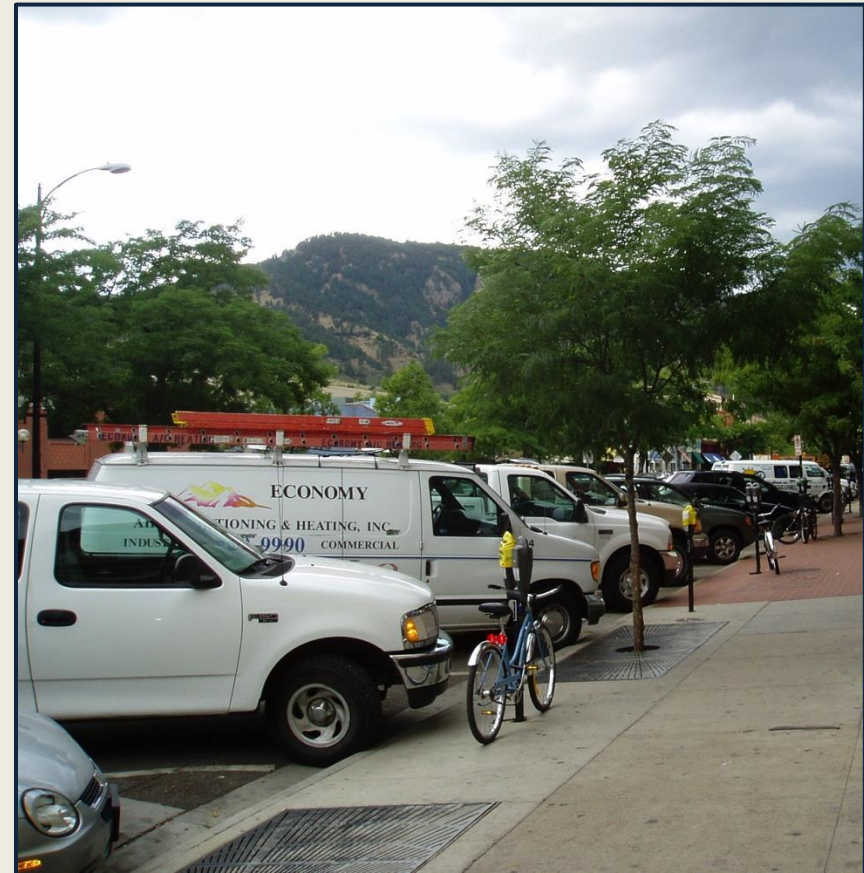
# utilization studies

supply

occupancy (% full)

turnover/duration

- ✓ *time of day*
- ✓ *day of week*





how full is “full”

great access, visibility

95%

rule of thumb

85%

poor access, visibility

75%

turnover

(average duration - hours)

on-street

0.5 – 2.0

surface lot

1.0 – 4.0

garage

2.0 – 8.0



parking management tools





# rational process

set objectives



identify strategies



allocate resources



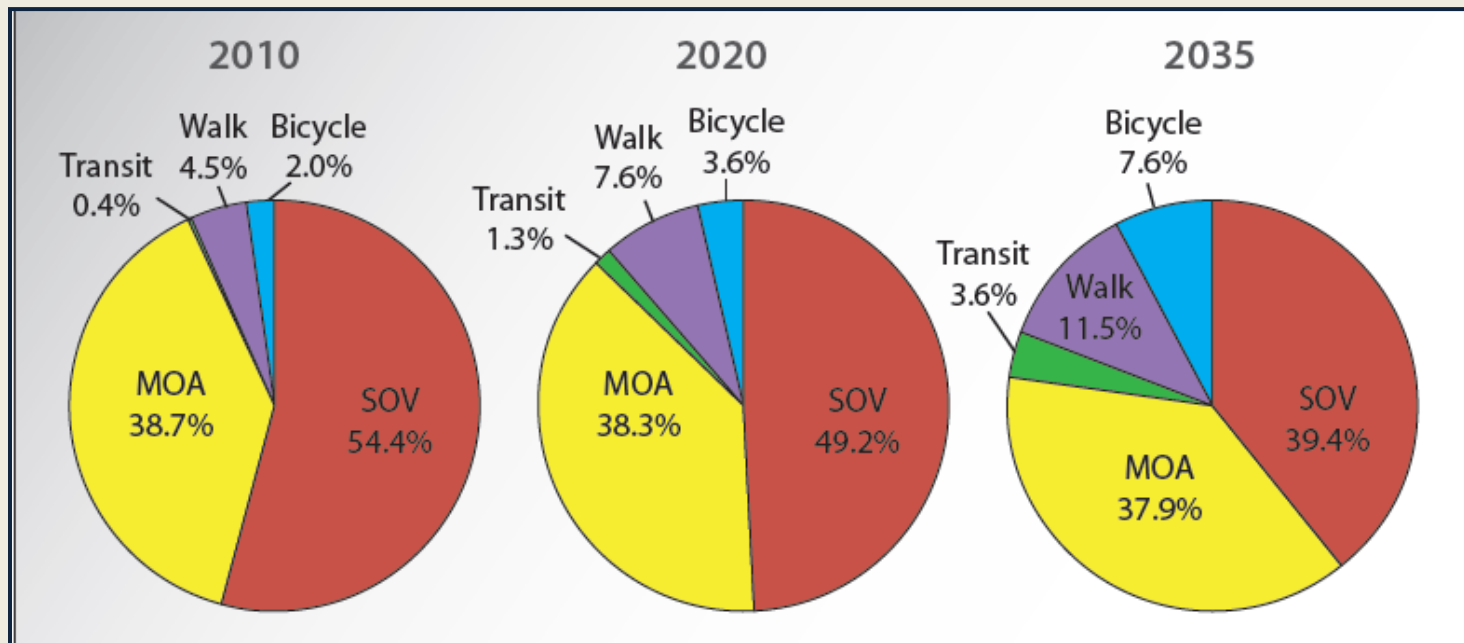
implement, monitor & report

# parking management tools

- ✓ mode shift
- ✓ shared parking
- ✓ unbundling
- ✓ fee in lieu
- ✓ grandfathering
- ✓ enforcement
- ✓ technology
- ✓ permit parking
- ✓ time limits
- ✓ paid parking
- ✓ parking district
- ✓ facilitate investment

# mode share

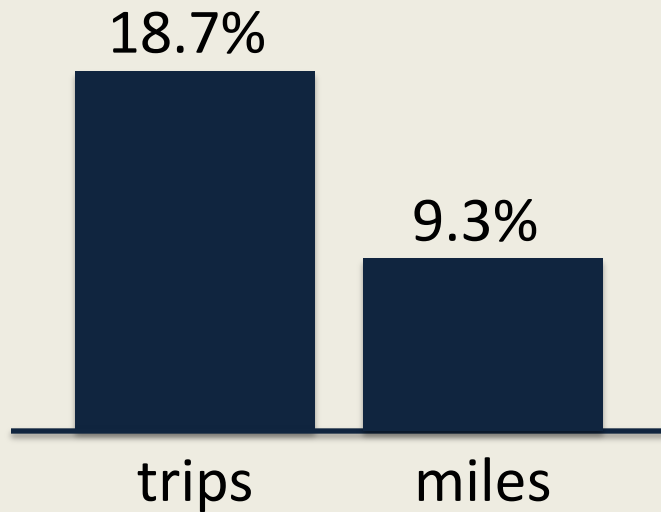
- ✓ expensive
- ✓ requires reallocation of transportation \$\$
- ✓ brings other benefits (public health, etc.)



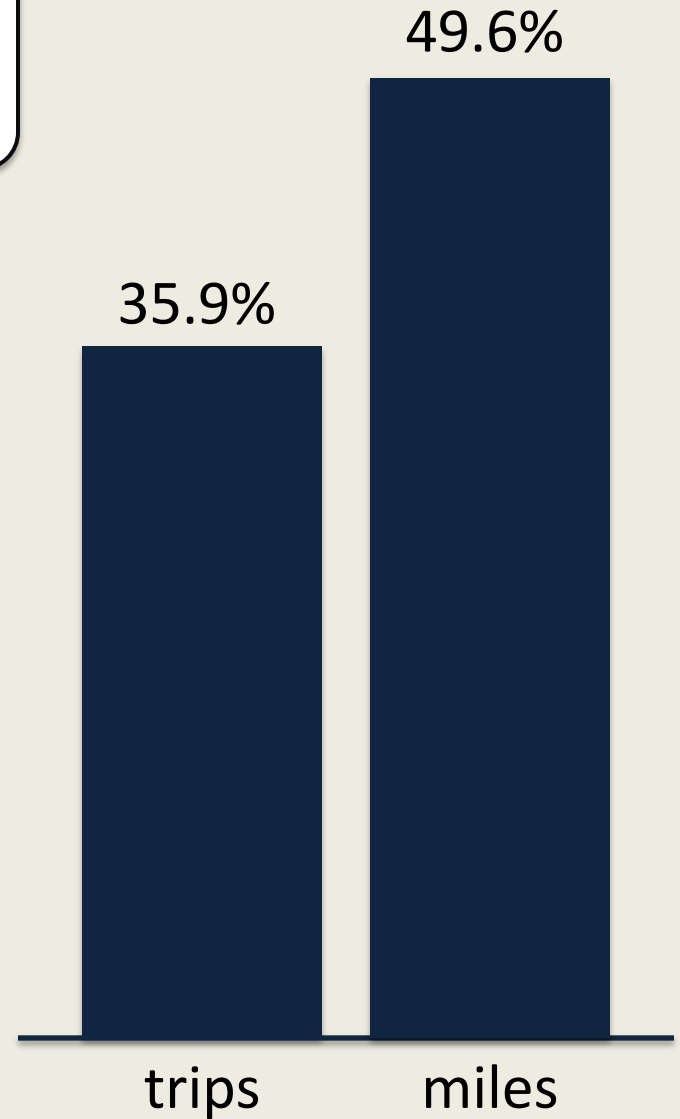


# trips vs. miles

(Boulder resident data)

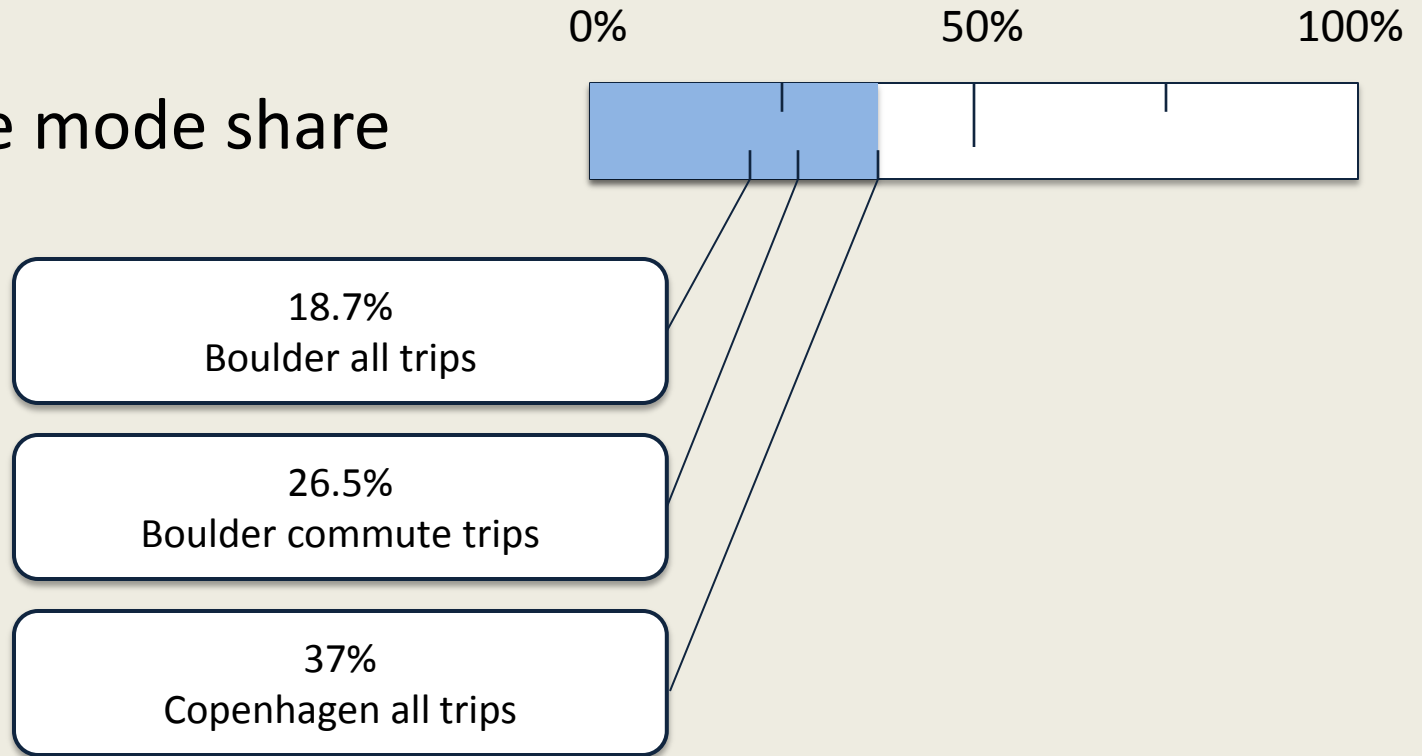


bicycle

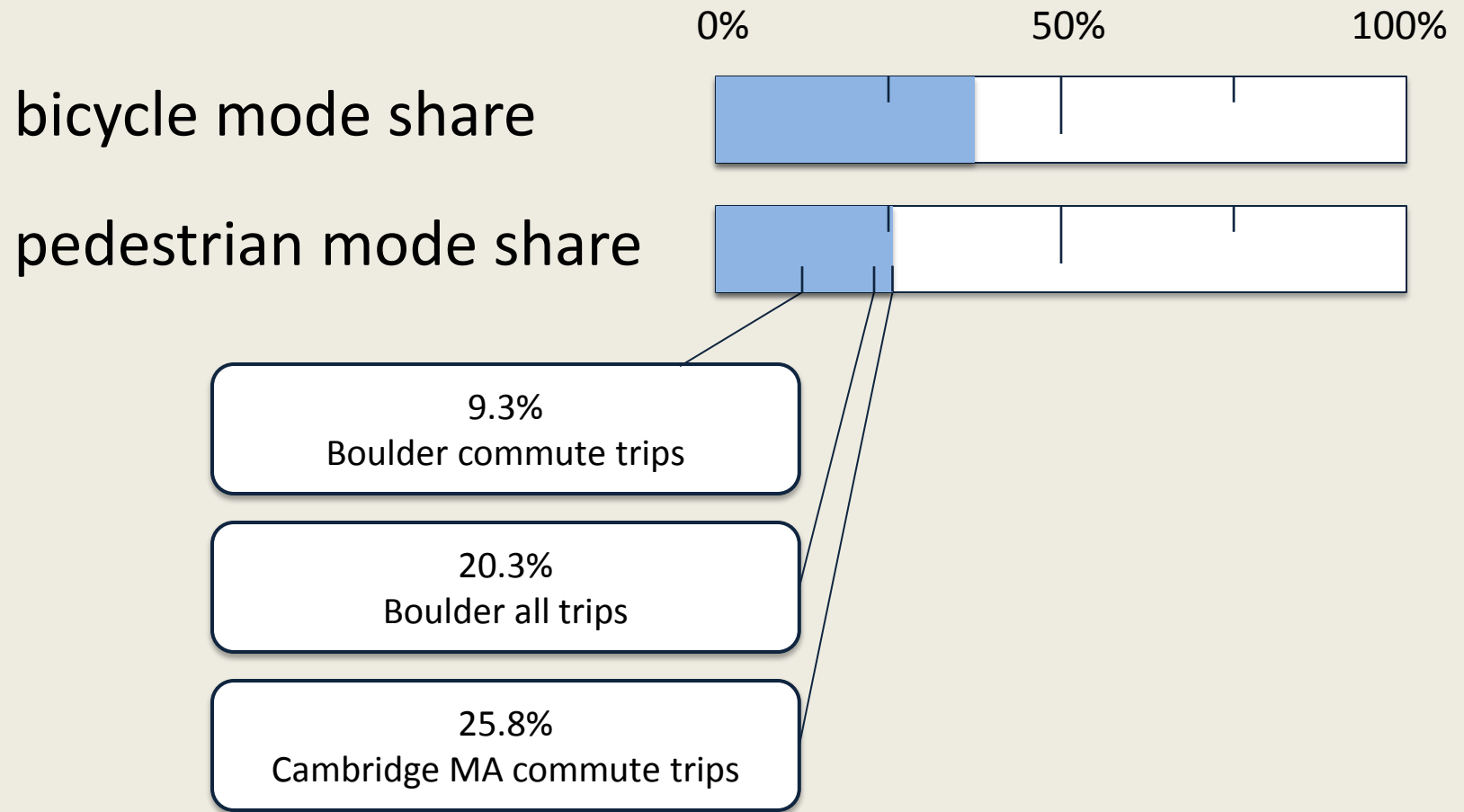


single occupant vehicle

bicycle mode share

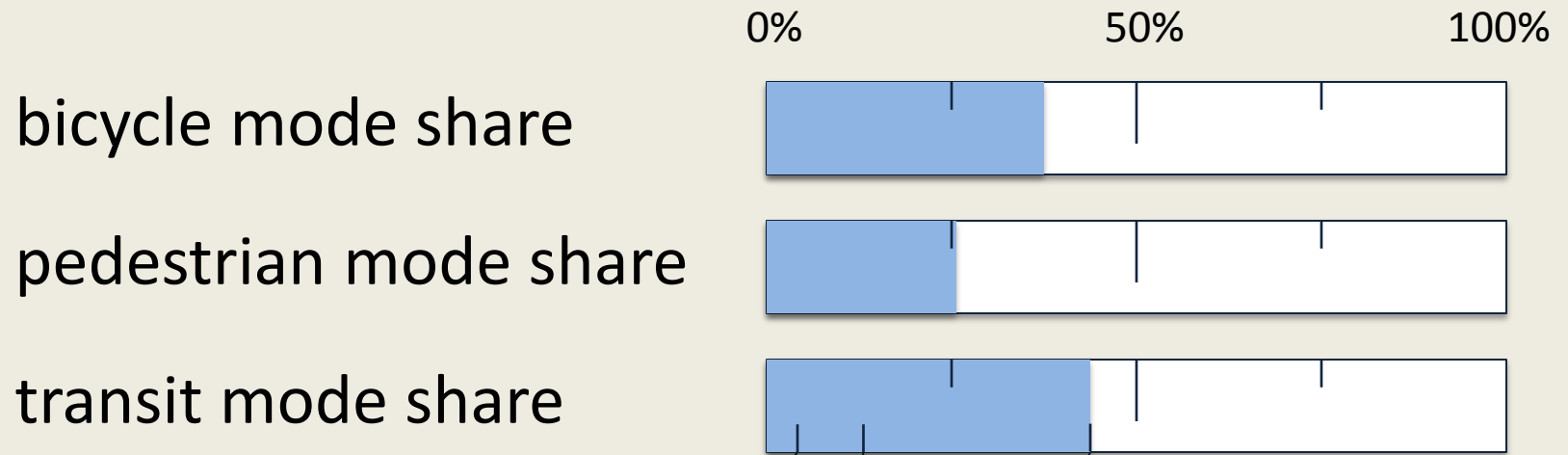


reasonable mode share ranges  
(trip mode share)



reasonable mode share ranges  
(trip mode share)



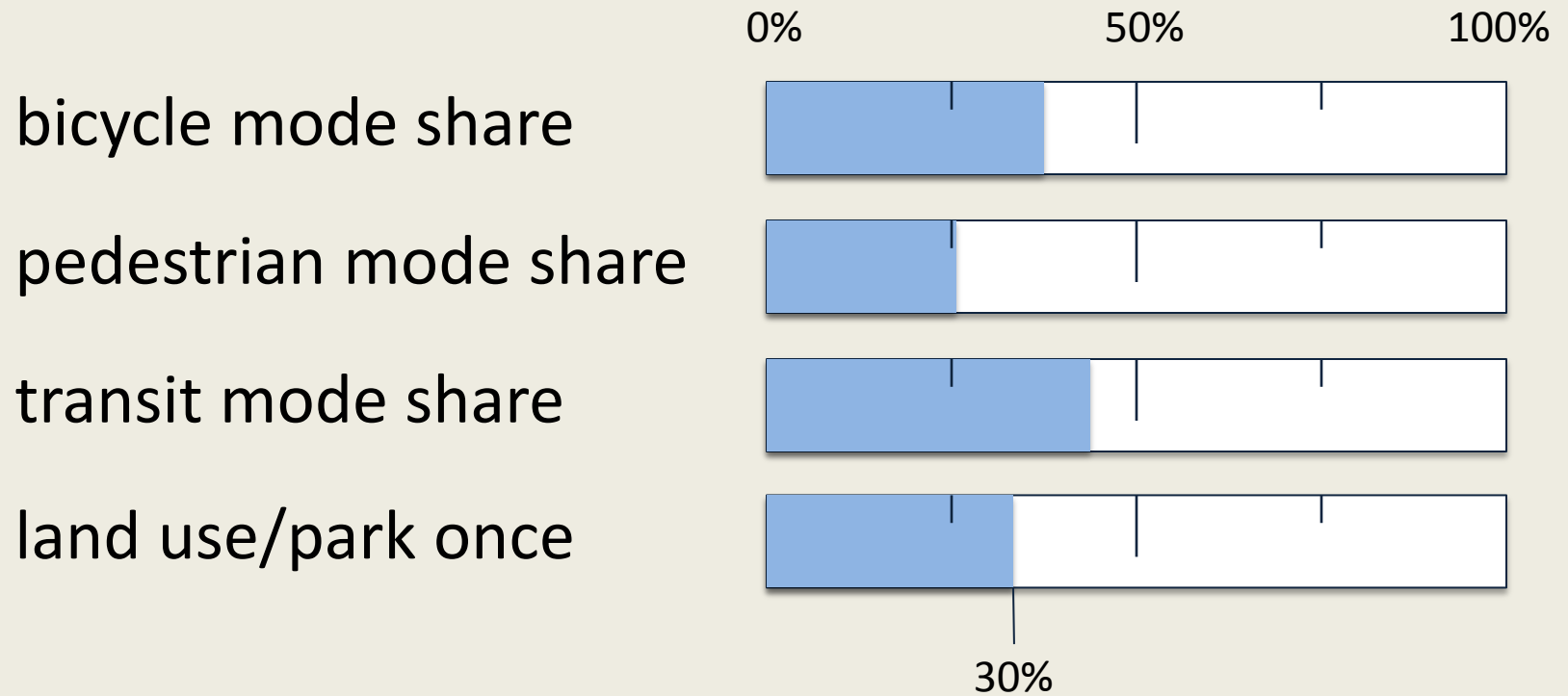


4.9%  
Boulder all trips

10.1%  
Boulder commute trips

44.4%  
Downtown Denver commute trips

reasonable mode share ranges  
(trip mode share)



*combined total reduction in demand: > 50%*

reasonable mode share ranges  
(trip mode share)

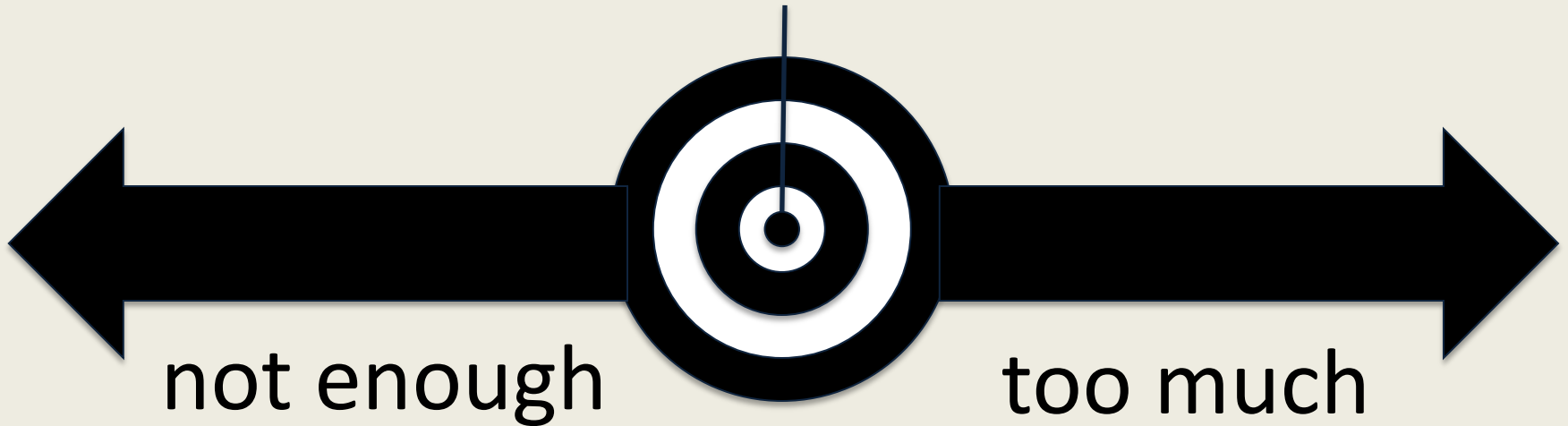
# strategic approach to supply



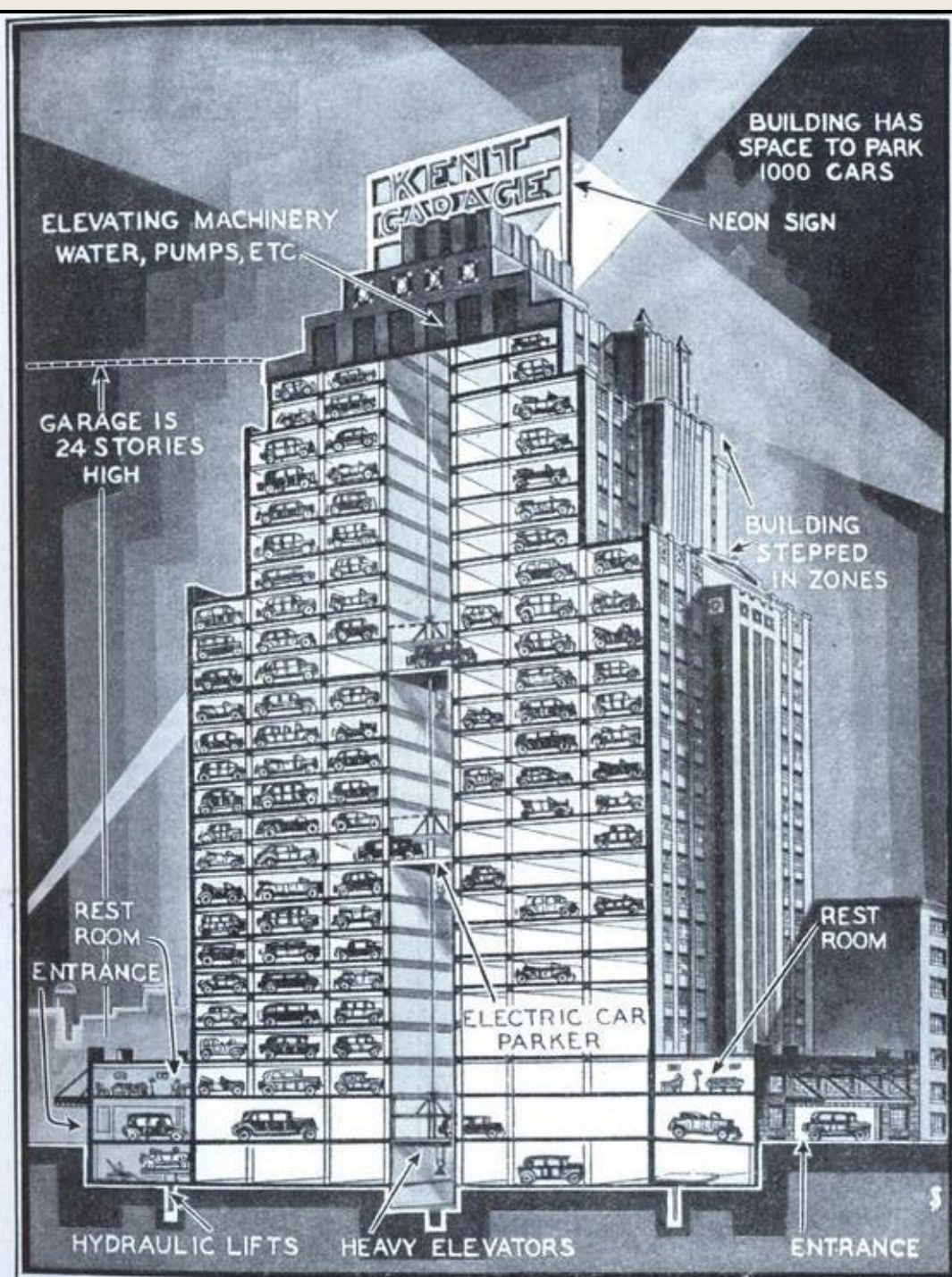


# the supply dilemma

the right  
amount



strategic  
timing



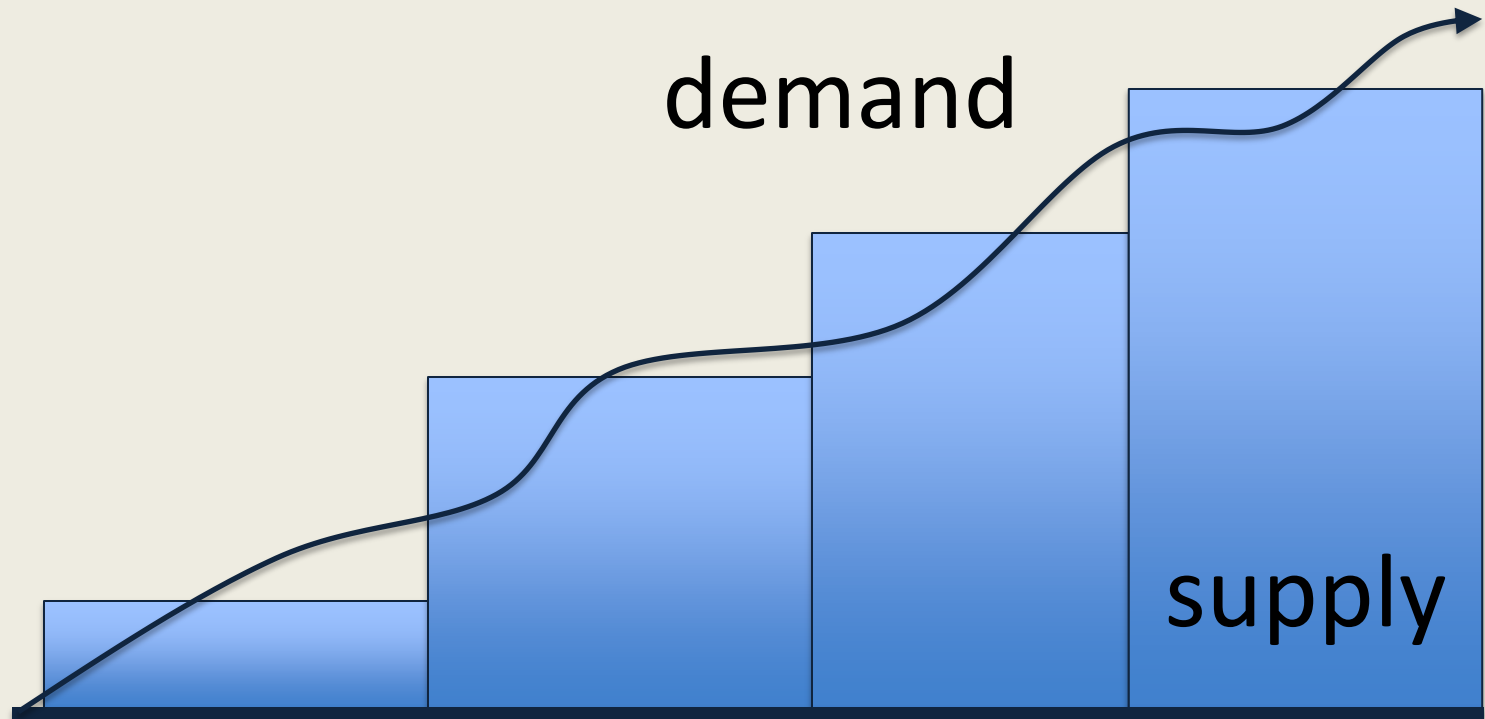
# 5th and Walnut

 **Parking Garage**



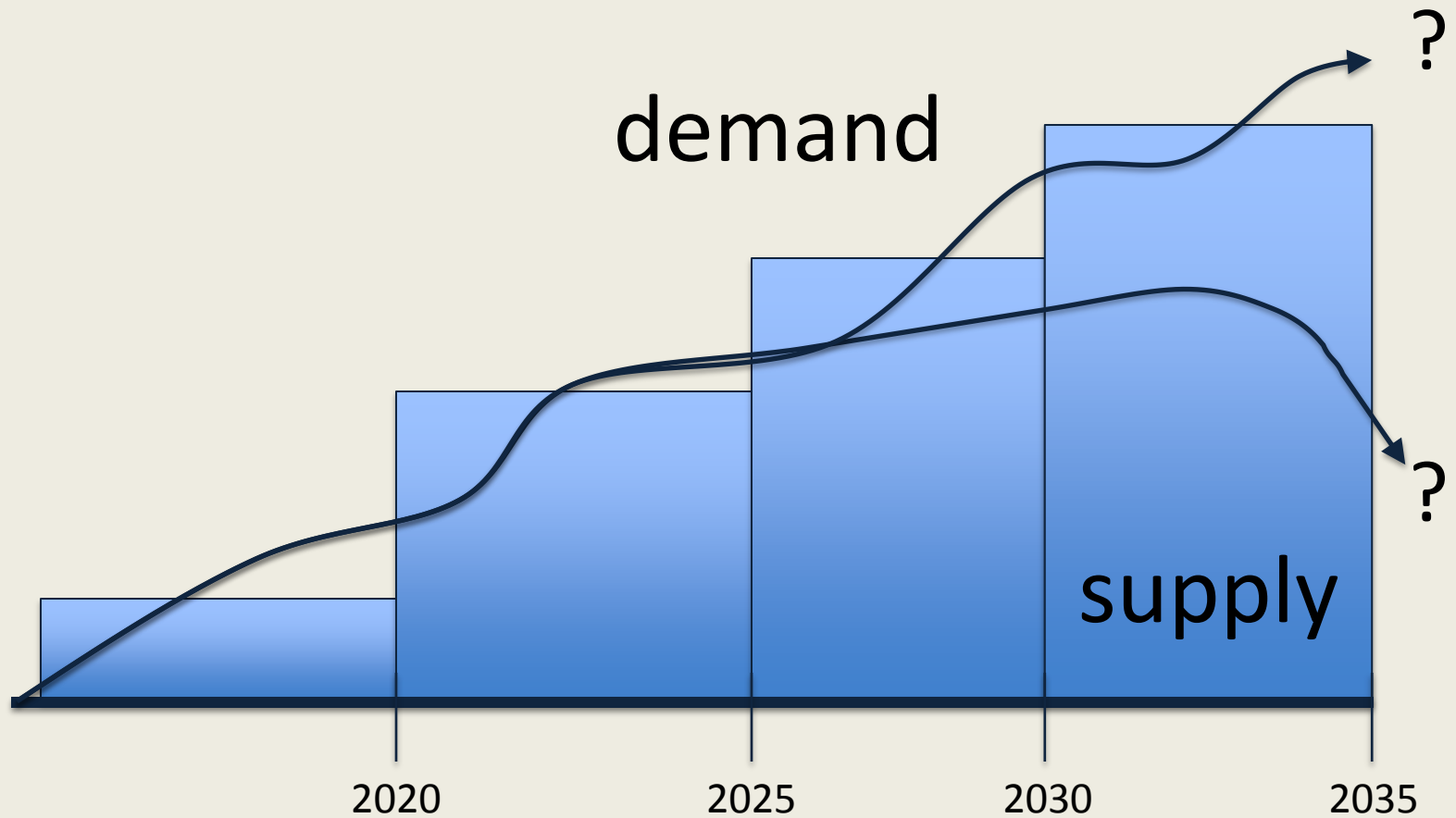
Columbia, MO

# the supply dilemma





# 2016 supply dilemma



supports  
storefront  
retail



on street parking



supports  
storefront  
retail

improves  
walkability



on street parking

supports  
storefront  
retail

improves  
walkability

reduces  
development  
costs



on street parking



no such thing as



**FREE PARKING**



# shared parking

- ✓ private – joint parking
- ✓ public – shared parking





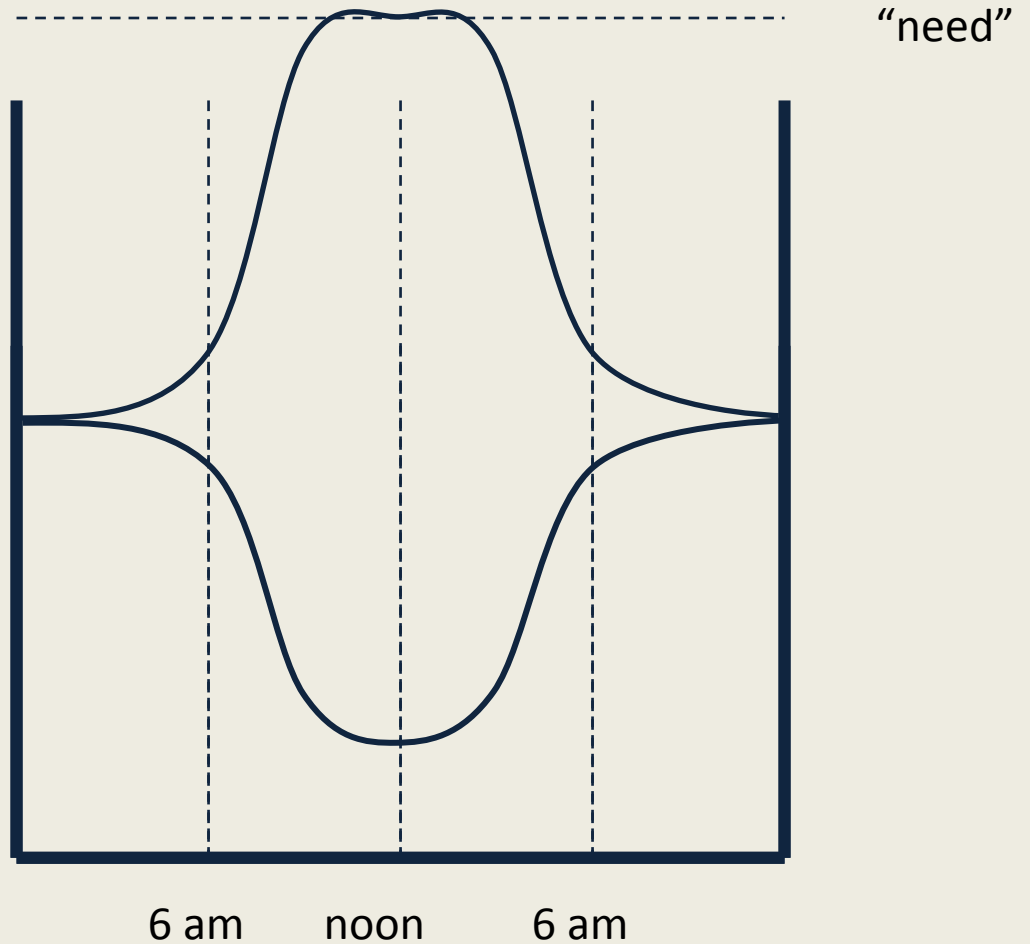
# joint parking

- ✓ private sector agreements
- ✓ between property owners/businesses



# traditional

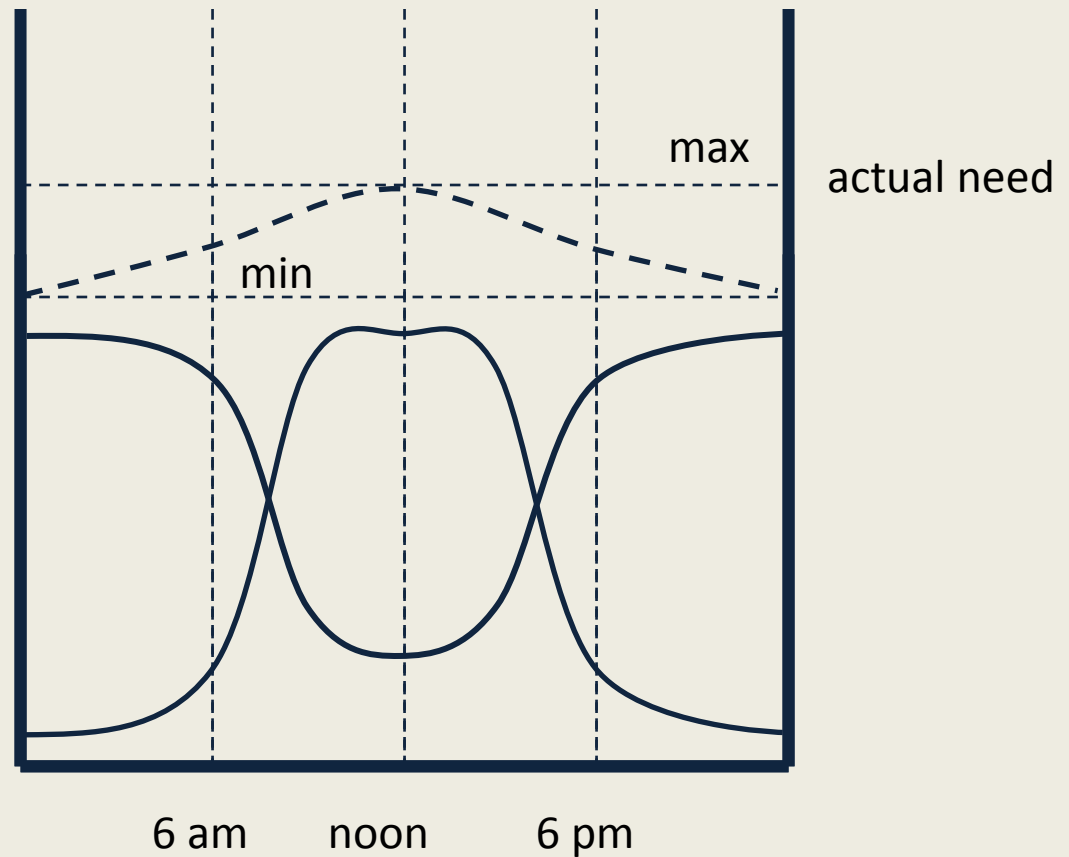
residential + office





# shared parking

residential + office



# shared parking

- ✓ based on underlying requirements
- ✓ reduced by a specific percentage
- ✓ requires on-site management

*smart code example (v 9.2)*

REQUIRED PARKING (See Table 10)

	T2   T3	T4	T5   T6
RESIDENTIAL	2.0 / dwelling	1.5 / dwelling	1.0 / dwelling
LODGING	1.0 / bedroom	1.0 / bedroom	1.0 / bedroom
OFFICE	3.0 / 1000 sq. ft.	3.0 / 1000 sq. ft.	2.0 / 1000 sq. ft.
RETAIL	4.0 / 1000 sq. ft.	4.0 / 1000 sq. ft.	3.0 / 1000 sq. ft.
CIVIC	To be determined by Warrant		
OTHER	To be determined by Warrant		

SHARED PARKING FACTOR

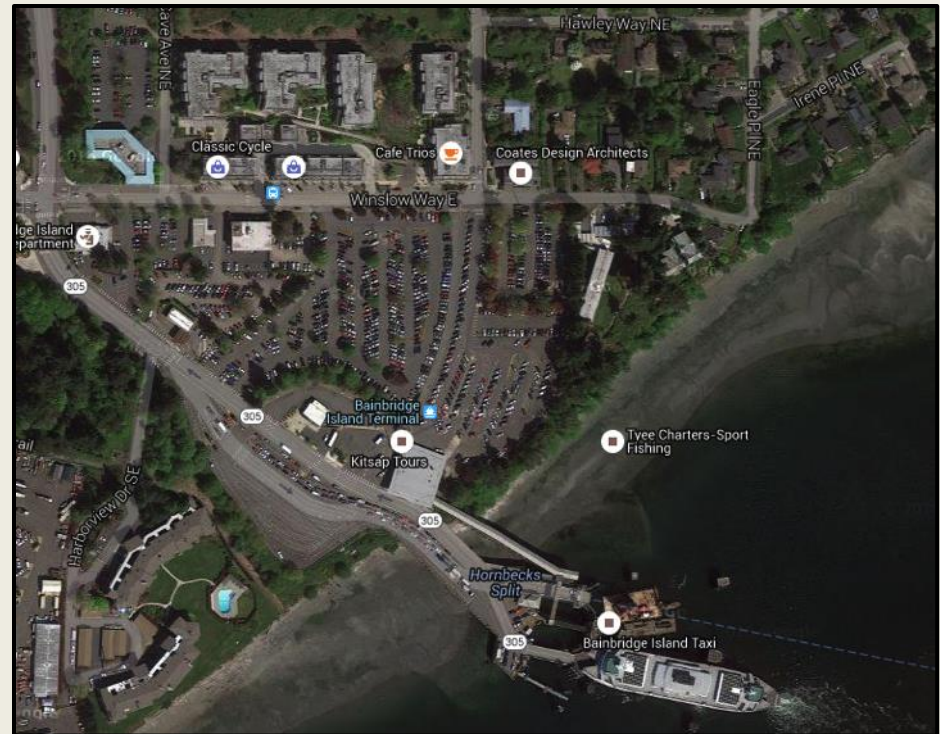
Function	with		Function
RESIDENTIAL			RESIDENTIAL
LODGING			LODGING
OFFICE		1	OFFICE
RETAIL		1.1	RETAIL
	1.1	1	
	1.4	1.1	
	1.7	1.4	
	1.3	1.7	
	1.2	1.3	
	1	1.2	

# unbundling

- ✓ residential land uses
- ✓ provide parking per code
- ✓ allow sale of spaces



Harbor Square, Bainbridge Island



# fee in lieu

- ✓ require parking per code
- ✓ pay fee to city, city provides
- ✓ reduced or no on-site parking

peripheral garages  
Downtown Orlando, FL





# grandfathering

- ✓ change of use & redevelopment projects
- ✓ retail, commercial land uses
- ✓ credit for pre-existing situation



Jackson, WY

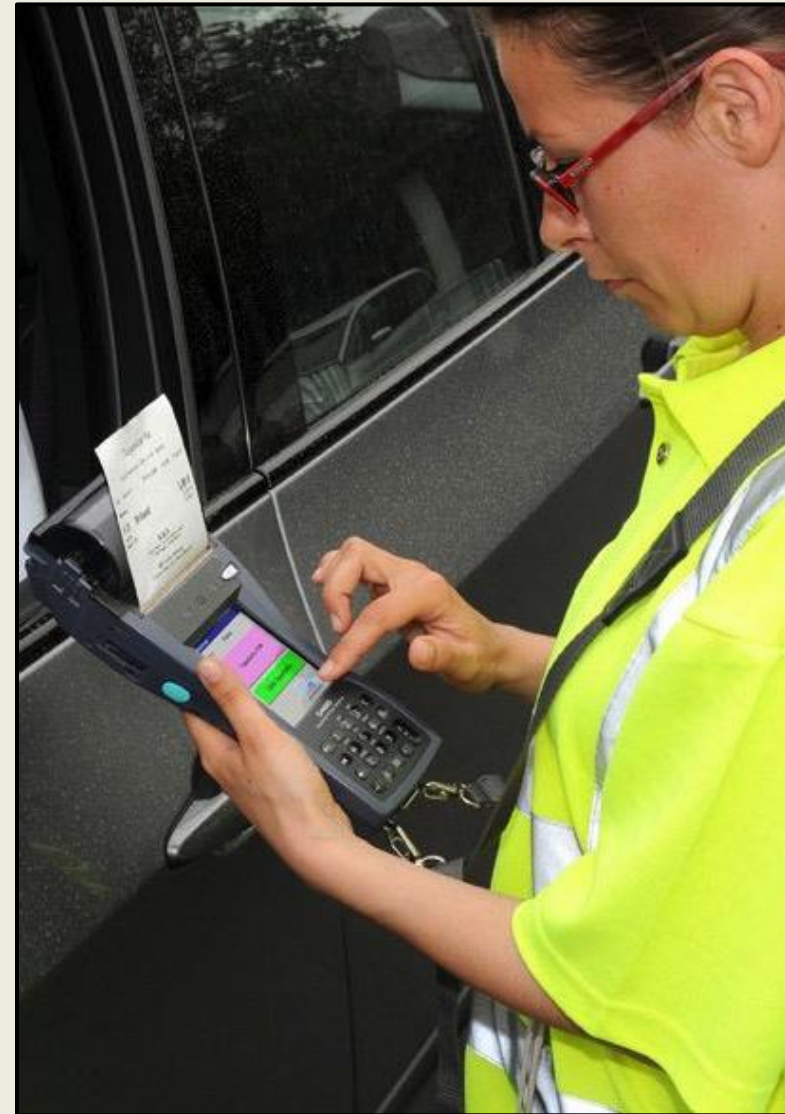


Bainbridge Is.



# enforcement

- ✓ friendly but inevitable
- ✓ rely on technology



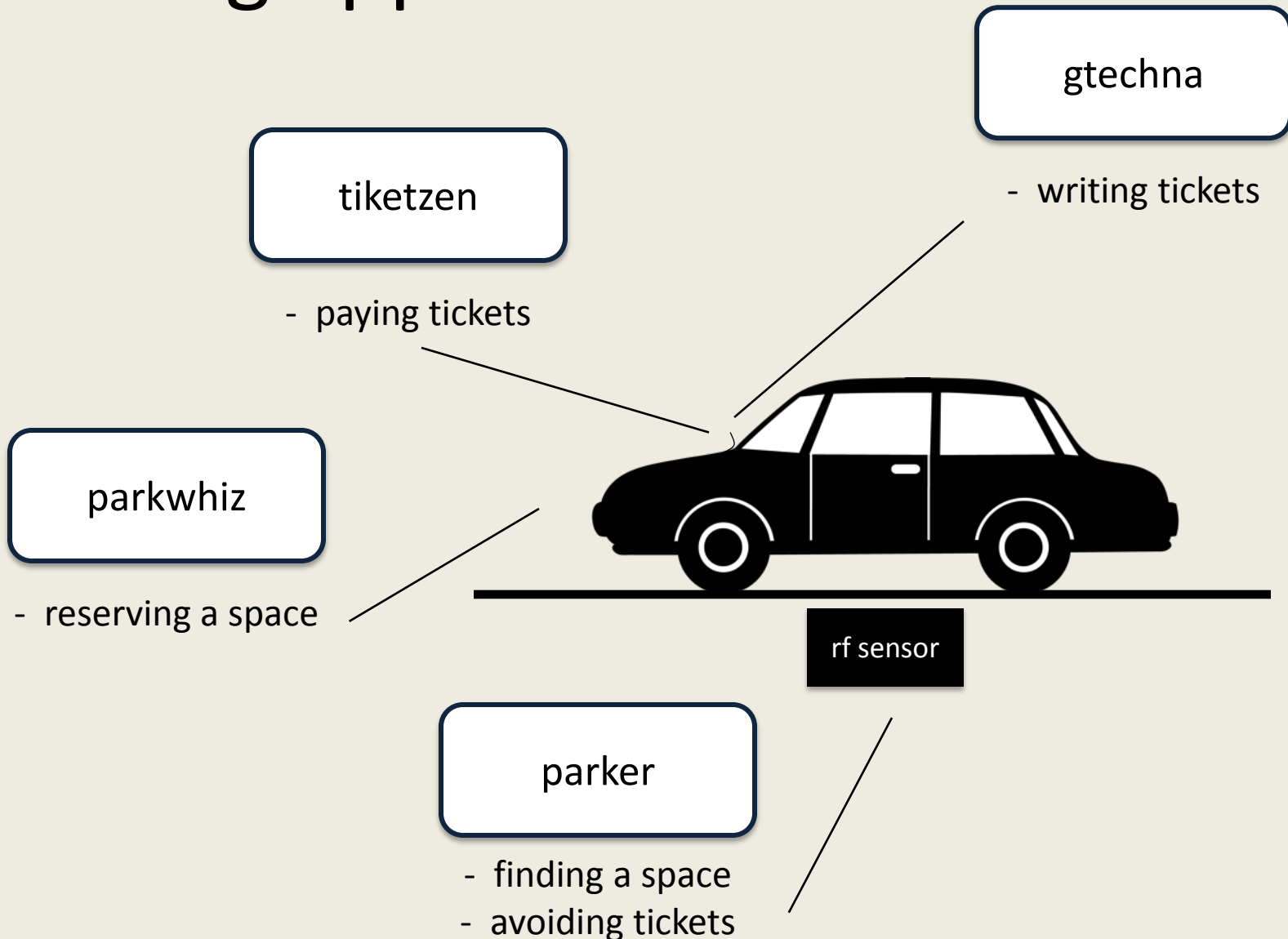
# enforcement technology

- ✓ be tech-cool
- ✓ provide convenient user interface
- ✓ do not underfund

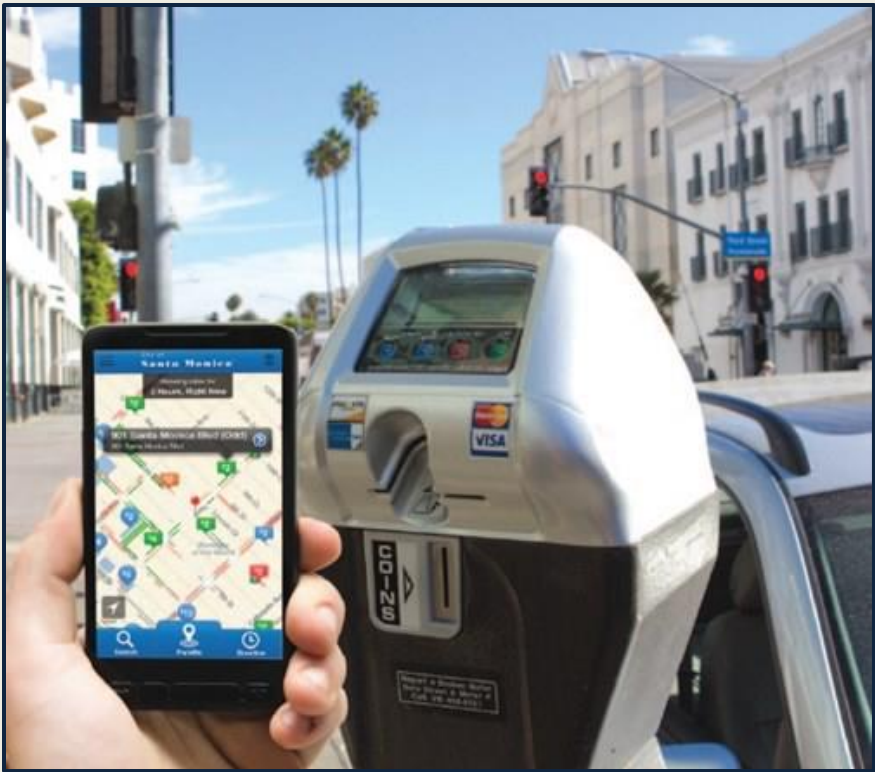




# parking apps

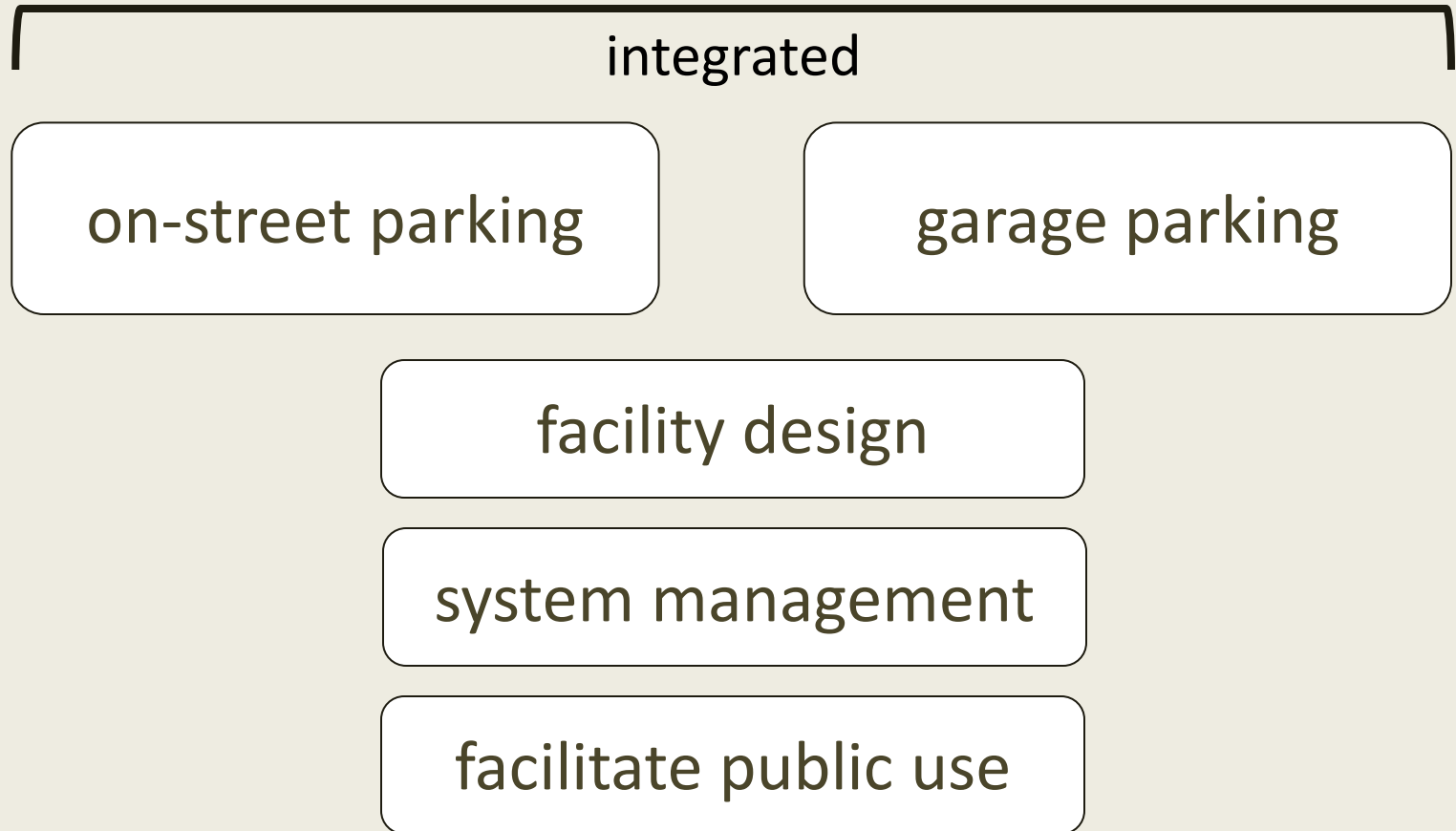








# smart parking technology options



# wireless mesh network

vehicle sensors



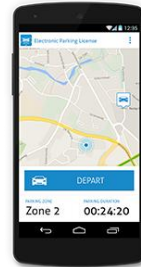
relay node



data collector



displays



smartphone apps



server + software +  
internet connection



# specifications



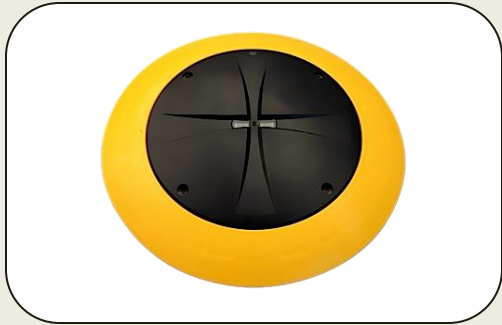
## sensors

- embedded – surface mount – flush mount
- infrared + magnetic vehicle detection
- radio frequency 902 – 928 MHz
- temperature range: -40°F to 185°F
- power supply: built-in lithium battery
- battery life: 5 – 10 years

## network

- 1 relay node/25 sensors (on street)
- communication range:
  - sensor – relay node 135'
  - relay node – relay node 325'
  - relay node – data collector 35'

# options: sensors



## surface mount

- glue on
- use in garages
- no snowplow



## embedded

- drill hole
- warm climates
- no snowplow



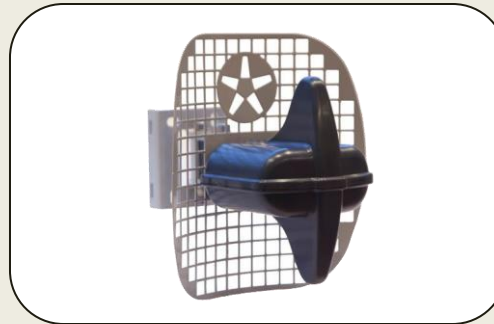
## flush mount

- drill hole
- snowplow resist.

price (estimated)



\$175



\$400



\$1,500

# commercial district on-street permit parking

use sparingly

- ✓ commuters
- ✓ students
- ✓ event attendees





# residential district on-street permit parking

- ✓ residents
- ✓ daytime commuters
- ✓ daytime students



- 
- ✓ city-wide ordinance
  - ✓ neighborhood application process
  - ✓ utilization studies

## time limits – on street

- ✓ 10 min – delivery
- ✓ 2 hour – retail
- ✓ 3 hour – restaurant and retail
- ✓ all day – commuters, residents



# time limits – off street surface lot

- ✓ 3 hour – restaurant and retail
- ✓ 4 hour – office, restaurant, retail, medical
- ✓ all day – commuters, students, residents



# parking district

- ✓ management
- ✓ enforcement
- ✓ shared parking
- ✓ mode share
- ✓ demand management
- ✓ supply







*downtown utilities*

water

solid waste

sidewalks

storm sewer

sanitary sewer

parking



## parking as a utility

- ✓ shared resources
- ✓ reduced costs
- ✓ fair-share funding
- ✓ management and operations

*“park once”*





example:

Boulder central area general improvement district (cagid)

5 mil property tax +  
parking revenues

```
graph TD; A[5 mil property tax + parking revenues] --> B[ecopasses]; A --> C[bike parking]; A --> D[sidewalks]; A --> E[demand management]; A --> F[parking supply];
```

ecopasses

bike parking

sidewalks

demand management

parking supply

developer parking  
requirement: 0

Boulder example: cagid





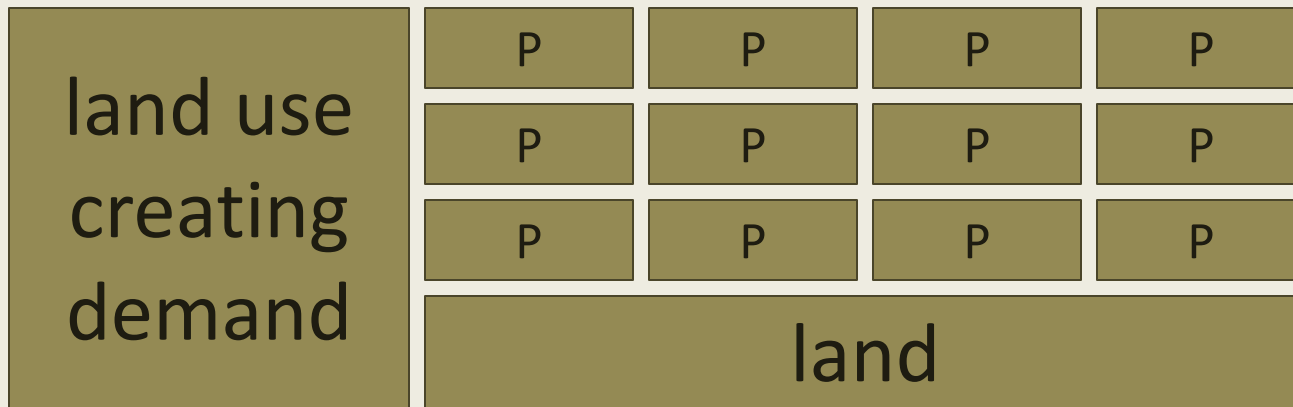
mixed use,  
walkable district with multimodal access





facilitate investment – allow variety of ownership models

# off-street parking – ownership/mgt models



# off-street parking – ownership/mgt models

## (1) traditional

- single owner



land use  
creating  
demand

P

P

P

P

P

P

P

P

P

P

P

P

land



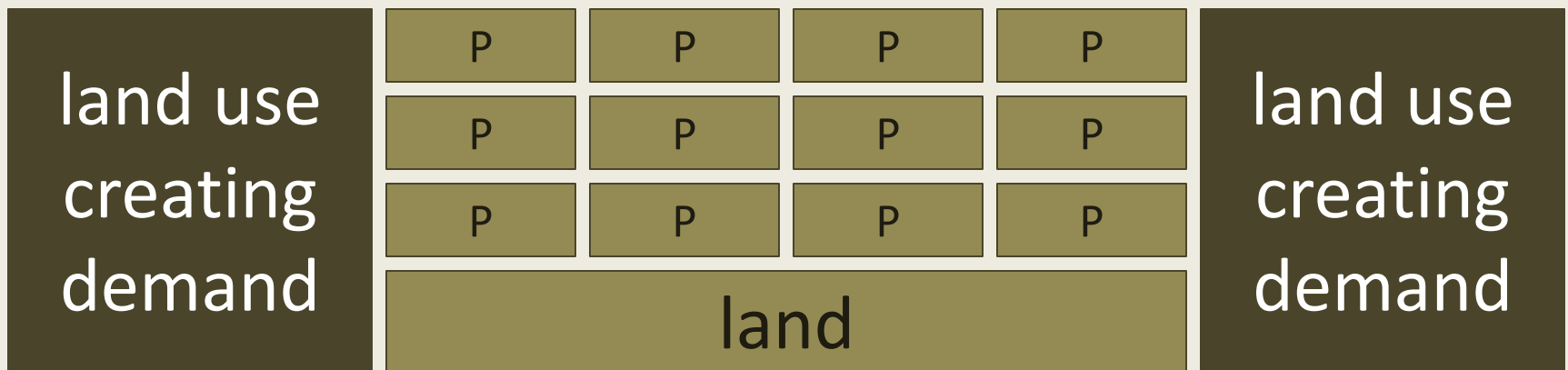
# off-street parking – ownership/mgt models



## (2) public

- single public owner – city or tax district

### permit parking + paid parking



# off-street parking – ownership/mgt models



## (3) condo garage

- sponsor owns land & spaces
- others buy or lease spaces

condo, leased and paid parking

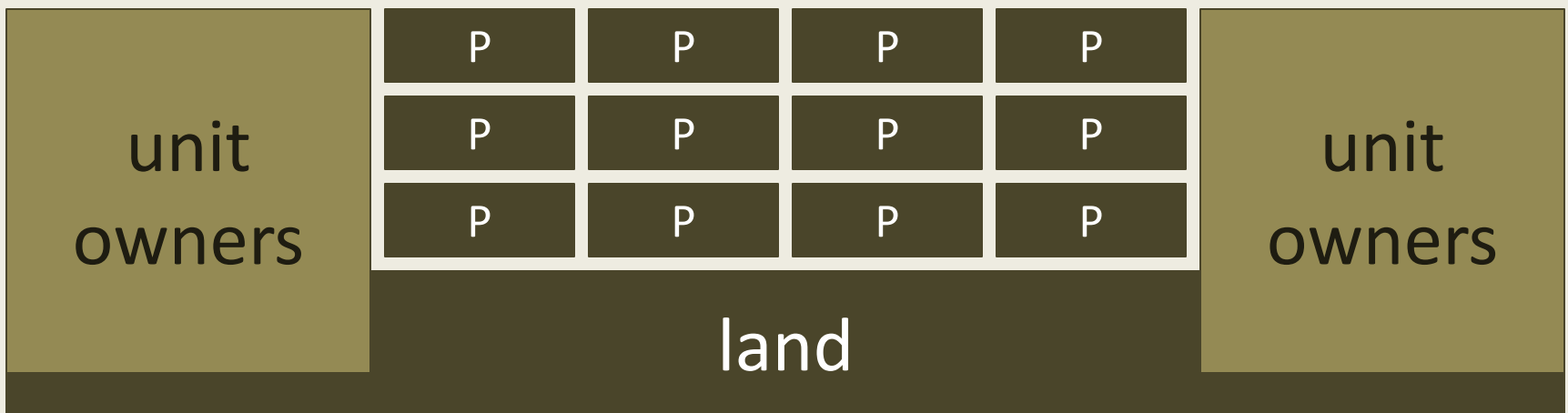


# off-street parking – ownership/mgt models

- (4) owners' association
- multiple unit owners



## condo parking or license parking



# off-street parking – ownership/mgt models

- (5) spec garage
- single owner



lease parking, paid parking, condo parking

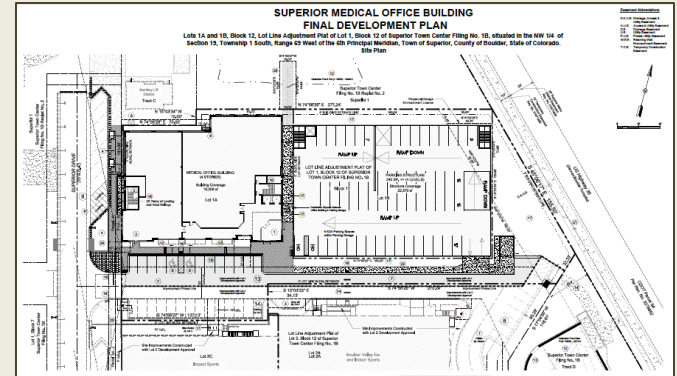




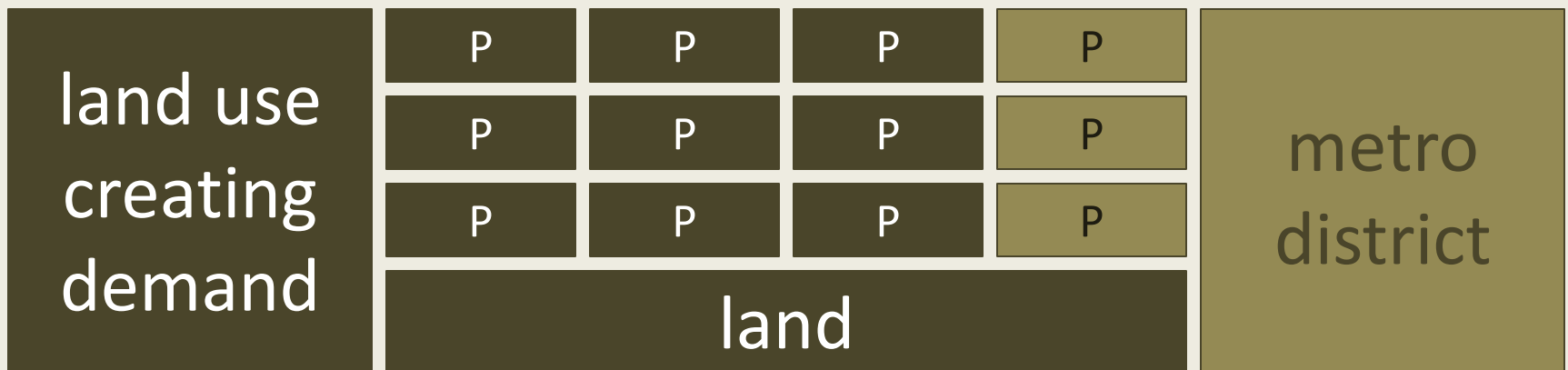
# off-street parking – ownership/mgt models

## (6) hybrid

- land developer + metro district



## permit parking + paid parking



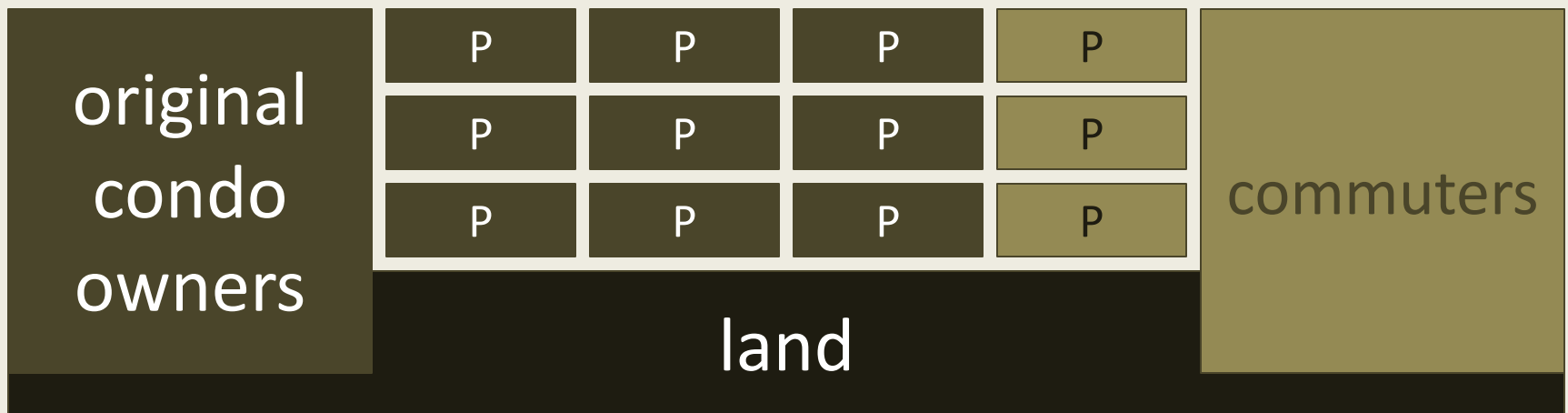
# off-street parking – ownership/mgt models



## (7) hybrid

- unbundled residential condos

### residential + commuters



# facilitate investment

- ✓ create regulatory allowance for shared parking
- ✓ allow (& monitor) joint parking agreements
- ✓ require unbundling of residential parking
- ✓ allow condo garages
- ✓ allow spec garages
- ✓ plan for phased transitions – surface to structure

# integrated approach

*land use*

land use inventory

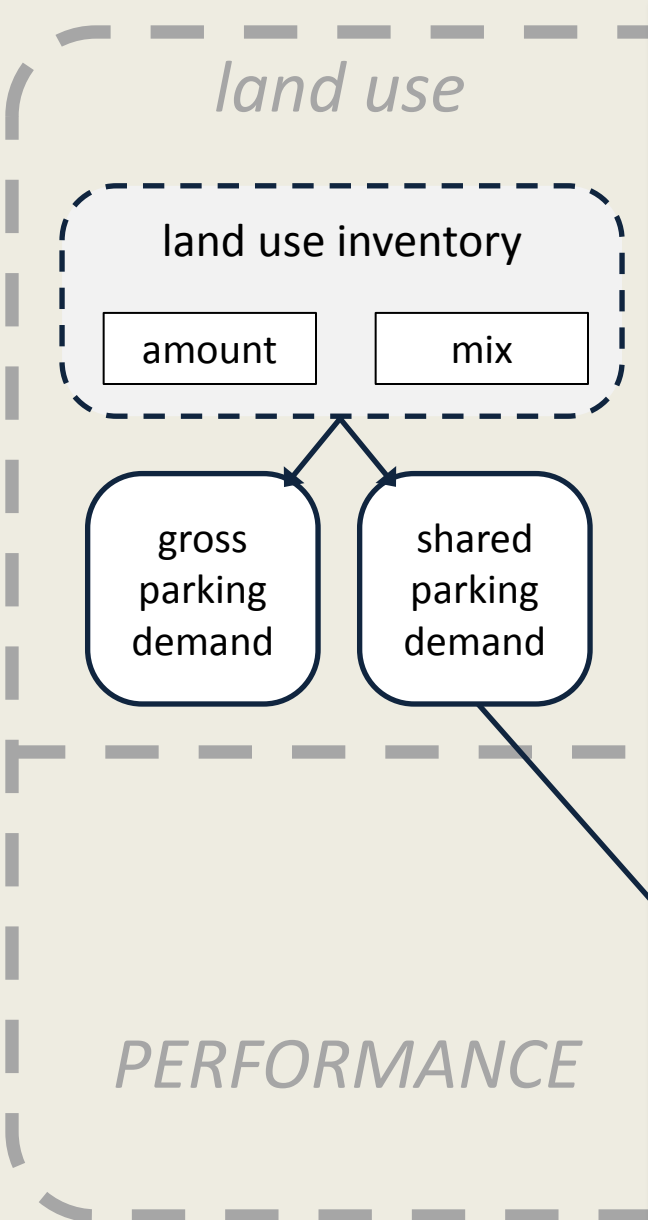
amount

mix

gross  
parking  
demand

shared  
parking  
demand

*PERFORMANCE*





# integrated approach

*land use*

*parking management*

land use inventory

amount

mix

gross  
parking  
demand

shared  
parking  
demand

management program

add parking supply

shift mode share

parking pricing

enforcement

*PERFORMANCE*

net demand

\$ cost

peak  
ratio  
85%

# integrated approach

*land use*

*parking management*

*supply*

land use inventory

amount

mix

gross  
parking  
demand

shared  
parking  
demand

management program

add parking supply

shift mode share

parking pricing

enforcement

base parking  
supply

new parking  
supply

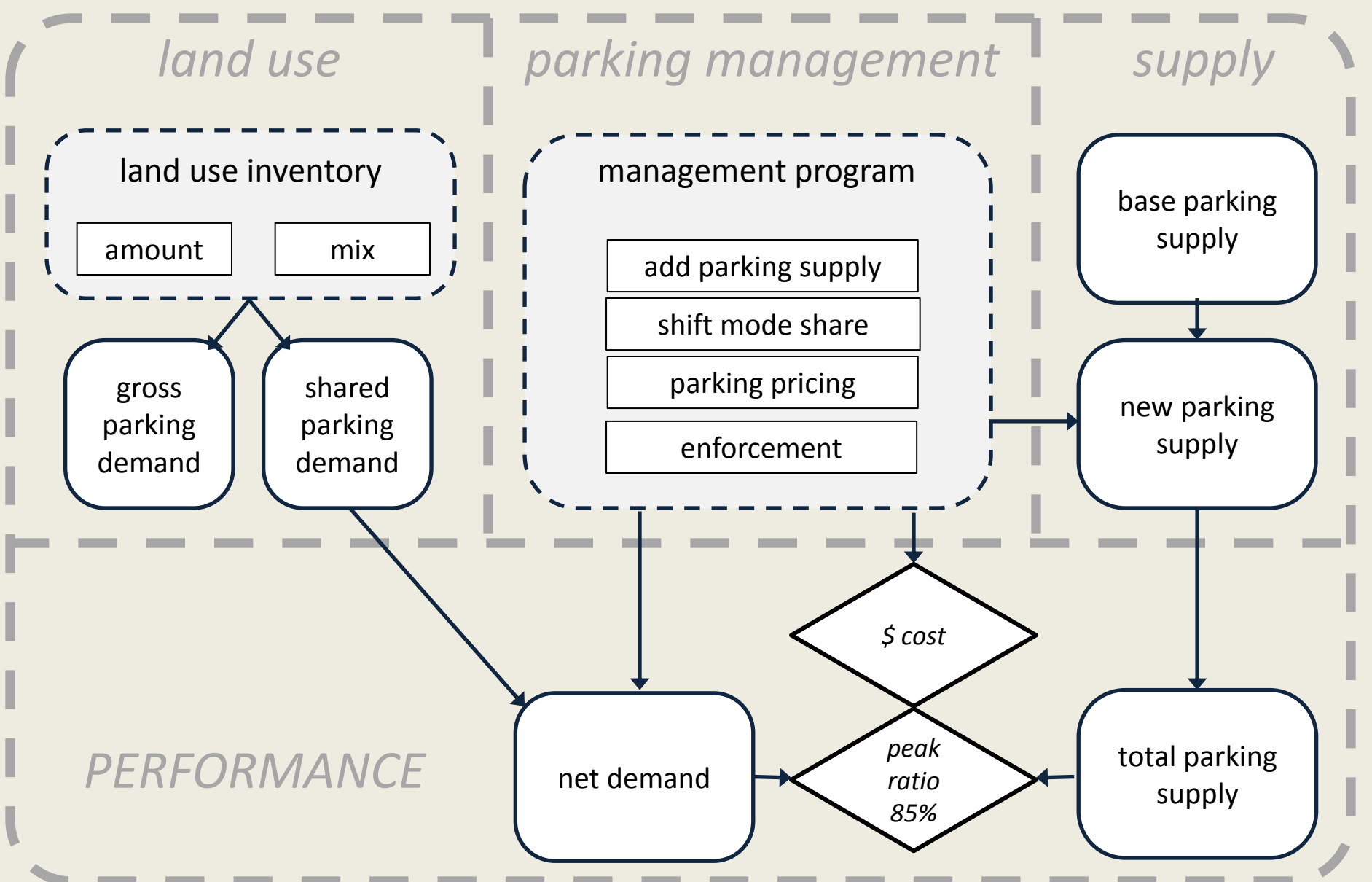
*PERFORMANCE*

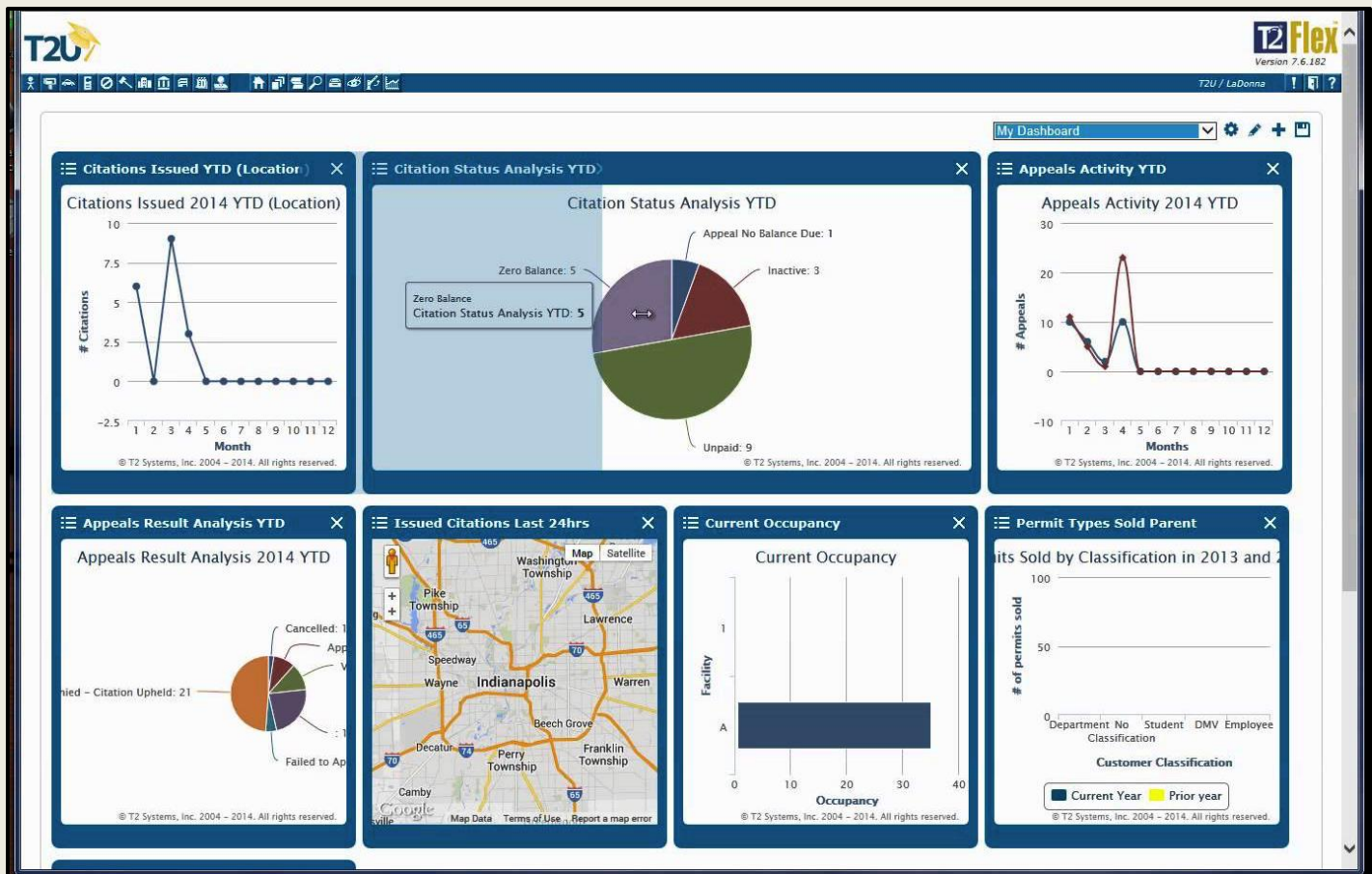
net demand

\$ cost

peak  
ratio  
85%

total parking  
supply





supply

turnover

revenue

% full

citations

project status



discussion





# break out group assignment

1. select note taker and reporter (two people)
2. develop a short list of parking issues the City should try to resolve
3. identify the **2** most important parking issues to address now
4. develop a short list of actions the City should take to resolve one or both of these issues
5. identify **1** highest-priority action for immediate implementation

wrap up by 11:00am